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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 28

Application Number: 09/352,612
Filing Date: July 13, 1999
Appellant(s): VAN VLIET ET AL.

Steven P. Catlin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9-15-03.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

Appellant's brief presents arguments relating to claims 9 – 12 and their withdrawal from consideration. This issue relates to petitionable subject matter under 37 CFR 1.181 and not to appealable subject matter. See MPEP § 1002 and § 1201.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1 – 23 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

(A) Listing of Prior Art References

CA 2,162,686	Van Vliet et al	11-1994
US 4,483,438	Kobiella	11-1984
US 4,265,954	Romanek	05-1981
CA 1,026,522	Saito	02-1978
US 3,560,291	Foglia et al	02-1971
FR 1,506,163	Hoechst AG	12-1966

(B) Brief Description of Prior Art References

Van Vliet et al teach a grid structure produced from weldable drawn plastic strips, wherein said grid structure is formed by bonding cross strips in at least one zone of overlap by electromagnetic radiation. The teaching of Van Vliet et al further addresses disorientation of the strips across the zone of overlap and maintaining the strength of the strips at the zone of overlap. Van Vliet et al teach bonding surface

layers over the entire zone of overlap failing to positively suggest spatially separated bonding line or bonding points within the zone of overlap.

Kobiella teach a film strap weld comprising a zone of overlap containing spatially separated bonding lines. Kobiella suggest conventional welding across the full width of the zone of overlap strap results in reduced weld strength and reduced strap strength at the weld since the strap orientation is destroyed in the fused region. The spatially separated bonding lines suggested by Kobiella overcome this reduction of strength, as not all of the straps orientation is lost in the zone of overlap.

Romanek provides additional examples of patterned bonding (see Figures 5 – 8), including parallel bonding lines, and bonding points.

Saito is an English language equivalent to DE 2,246,051, to which Van Vliet et al refers to as a suitable teaching for the manufacture of a mat.

Foglia et al is directed to welding thermoplastic materials, such as foils or strips, by employing a laser that passes through outer transparent layers to an inner absorbing layer, which generates heat to fuse.

Hoechst is also directed to welding thermoplastic materials such as foils or strips and discloses laser means which pass through non-absorbent layers to absorption particles at the welding site, wherein said absorption particles are disclosed as generally being pigments.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 – 5, 7, 13 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vliet et al (CA 2,162,686) in view of Kobiella (US 4,483,438), Romanek (US 4,265,954) and Saito (CA 1,026,522).

Van Vliet et al discloses bonding drawn, overlapped plastic strips by welding together the strips via electromagnetic radiation. In a first embodiment, Van Vliet et al discloses bonding a single strip to itself by its ends and in a second embodiment Van Vliet et al suggests that the same bonding technique can be used to form mats from crossed strips welded together at zones of overlap (page 3, lines 4 - 30). The teaching to Van Vliet et al is concerned with maintaining the orientation at the welding site of the overlapped strip(s) so as to minimize the possible loss of strength by employing electromagnetic absorption particles. The weld is achieved by melting only the region containing these particles, so that outside regions (i.e. regions free of particles) are not melted so that disorientation of the strips is largely or even usually completely absent (Page 2, lines 5 – 18). While this appears to define a point bonding process, it does not positively suggest at least two spatially separated bonding points or bonding lines within the zone of overlap, as it appears the spaced absorption particles still act to melt and fuse the entire zone of overlap.

The secondary reference to Kobiella is also directed towards maintaining the orientation and therefore tensile strength at the zone of overlap for plastic strips. In welding a single plastic strip to itself, Kobiella teaches fusing in spatially separated parallel bonding lines across the overlap as this provides a fused weld that doesn't

destroy the orientation across the entire overlap and therefore maintains the tensile strength at said overlap.

Both Van Vliet et al and Kobiella are directed towards welding techniques that avoid disorienting the strips across the zone of overlap and therefore maintaining the strength of the strips at the zone of overlap, where in one embodiment Van Vliet et al like Kobiella disclose bonding a single strip to itself. Therefore, one reading Van Vliet et al would have been motivated to look to Kobiella as it is directed to a similar problem of bonding plastic strips. Furthermore, in view of Van Vliet et al disclosing a second embodiment of employing the welding technique to overlapped plastic strips in forming a grid, one of ordinary skill in the art would have been motivated to also look to Kobiella in welding overlapped strips in forming grids, wherein it would have been obvious to one of ordinary skill in the art at the time of the invention to group the absorption particles of Van Vliet et al in at least two spatially separated bonding lines to further the degree at which regions in the zone of overlap remain free of disorientation and therefore increase the degree to which the strength of the strips is maintained in the zone of overlap as is a benefit of spatially bonding as disclosed by Kobiella.

Romanek is cited as providing additional examples of patterned bonding (see Figures 5 – 8), including parallel bonding lines, and bonding dots patterned throughout the overlapped regions.

Saito (CA 1,026,522) is cited as being an English language equivalent to DE 2,246,051, to which Van Vliet et al refers to as a suitable teaching for the manufacture of a mat (Van Vliet et al, page 3, lines 23 – 25). Saito provides a more positive

suggestion for uniaxially stretching the polymeric strips in the longitudinal direction, wherein the polymeric strips are superimposed to form a grid-like mat (see Fig 1).

In regard to claim 2, Kobiella shows eight separated parallel bonding lines in Figure 2 and Romanek illustrates three parallel bonding lines in Figure 7.

In regard to claim 3, Romanek clearly illustrates bonding at the corners of the overlapping zones in Figures 5, 6, and 8. The bonding lines of Kobiella in Figure 2 are displayed on both edges of the overlap.

In regard to claims 4 and 5, Kobiella teaches the parallel bonding lines, or fused regions, to be 2.5 mm in width (Col. 4, lines 13 – 27).

As to claim 6, it is unclear how welding by means of a laser fails to define a product grid that is a materially different product from that suggested by Van Vliet et al. Furthermore, Van Vliet et al disclose electromagnetic radiation.

As to claim 7, Romanek teaches a variety of bonding patterns and discloses that a large number of variations can be employed to provide a variety of different physical characteristics of stretch and strength. Romanek further suggests that light or severe bonding may be carried out, depending upon the product being made (Column 6, lines 46 – 58). In view of this teaching, one of ordinary skill in the art would readily recognize that the strength of the bond throughout the overlap can vary by the bonding pattern and therein one obvious variation would be to implement more bonding points or lines towards the center of the overlap as compared to the edges, which would result in the center of the overlap having a stronger bond.

As to claims 13 and 17, both secondary references illustrate bonding patterns comprising at least two spatially separated bonding lines (Figure 2 of Kobiella and Figure 7 of Romanek).

As to claims 14 and 18, again Van Vliet et al references Saito in regard to the construction of the mat. Referring to Fig 1 of Saito, a mat is disclosed formed of superimposed strips, wherein the zones of overlap within the mat are diagrammed to have dimensions defined by the width of each strip and therefore the surface area of the zone of overlap will approximately equal the product of each strip's width.

As to claims 15 and 16, Van Vliet et al as noted in Saito teaches forming a mat having high tensile strength in the longitudinal direction because each strip of the mat has been drawn to orient the molecules in the longitudinal direction. Furthermore, Van Vliet et al suggests that the mesh mats have almost the same strength as the sum of the strengths of the strips located in one direction (page 4, lines 12 – 15.)

As to claim 19, Van Vliet et al discloses at least one layer of the strips comprise a surface layer having embedded therein absorption particles. This surface layer acts as a contact layer between overlapping strips so that upon subjecting the absorption particles to electromagnetic radiation, the overlapped strips are heated and welded to each other as the embedded particles provide the surface layer with a distinctly higher absorption capacity for the electromagnetic radiation compared to the plastic to which the strips are made. One of ordinary skill in the art would have readily appreciated in view of Van Vliet et al suggestion that the overlapping plastic strips have a lower absorption capacity in comparison to the surface layer, said plastic strip would be

transparent to the electromagnetic radiation to permit the radiation to travel through at least one plastic strip so as to be absorbed by the implemented surface layer.

Claims 6 and 19 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Vliet et al (CA 2,162,686) in view of Kobiella (US 4,483,438), Romanek (US 4,265,954) and Saito (CA 1,026,522) as applied to claim 1 above, and further in view of Hoechst (FR 1,506,163) and Foglia et al (US 3,560,291).

In regard to claim 6, as addressed above, it is unclear how the method limitation of employing a laser further defines the product grid of claim 6. In any event, in view of Van Vliet et al suggesting electromagnetic radiation, it would have been obvious to one of ordinary skill in the art to employ a laser beam as the source of the radiation as laser beams are well known to be used to weld thermoplastic materials (e.g. foils, films, strips, or the like) as evidenced by Hoechst and Foglia et al. Furthermore, in view of the motivation of Kobiella and Romanek to provide spaced bonding patterns to the bonded overlaps of Van Vliet et al, one of ordinary skill would have been motivated to employ a laser beam as bonding with lasers enables a welding area or spot to be made of various sizes (Foglia et al., Col. 8, lines 28 – 43) and bonds to be formed in very short times (Foglia et al., Col. 1, lines 54 – 59).

As to claim 19, as addressed above, Van Vliet et al discloses that at least one layer of the strips comprise a surface layer having embedded therein absorption particles. This surface layer acts as a contact layer between overlapping strips so that upon subjecting the absorption particles to electromagnetic radiation, the overlapped

strips are heated and welded to each other as the embedded particles provide the surface layer with a distinctly higher absorption capacity for the electromagnetic radiation compared to the plastic to which the strips are made. One of ordinary skill in the art would have readily appreciated in view of Van Vliet et al suggestion that the overlapping plastic strips have a lower absorption capacity in comparison to the surface layer, said plastic strip would be transparent to the electromagnetic radiation to permit the radiation to travel through at least one plastic strip so as to be absorbed by the implemented surface layer. Foglia et al is applied as evidence to backup the assertion that one of ordinary skill in the art would have readily appreciated the plastic strips of Van Vliet et al to have been transparent to the electromagnetic radiation as Foglia et al suggests transparent outer plastic films to reach in an inner absorbing layer with electromagnetic radiation in a plastic film welding operation (see Figures).

As to claim 20, Van Vliet et al suggests that the embedded absorption particles can include particular soot particles, magnetite powder and/or metal powder (page, 6, lines 2 – 6). Hoechst is evidence that such absorption particles employed in polymeric materials being welded together by emission sources such as lasers, are identified as pigments (see Derwent Abstract).

In regard to claims 21 – 23, Van Vliet et al suggest providing the plastic strips with thin surface layers (10 to 40 micrometers) containing the absorption particles. Furthermore, Foglia et al teach in an alternative embodiment to interpose an absorbing layer in the form of film, between a pair of plastic films to be welded together. Foglia et al suggests the thickness of the interposed absorbing film is a fraction of the welding

films, wherein the welding films are taught to have a thickness in the range of 0.5 to 10 or 20 mils (Foglia et al, Col. 2, lines 7 – 22; Col. 7, lines 65 – 71).

(11) Response to Argument

Appellant's argument with respect to Van Vliet et al and the entire zone of overlap being melted to form a weld extending over the entire zone of overlap and thus the conclusion that Van Vliet et al teaches spatially separated bonding points is erroneous is persuasive (Appellant's Brief, page 14, line19 – page 16, line 23). The examiner rescinds the position that the spaced absorption particles would define spatially separated bonding points within the zone of overlap. However, the rejection as set forth in the final rejection directed to rendering obvious spatially separated bonding in Van Vliet et al by the secondary reference to Kobiella is still maintained, as it was never withdrawn.

In regard to appellant's argument with respect to Kobiella, it is recognized that Kobiella teaches spatially separated bonding lines at the zone of overlap in a single strip wrapped onto itself and not at the zone of overlap formed by crossing strips in a grid. However, in view of the both the primary reference to Van Vliet et al and the secondary teaching of Kobiella being directed to increasing the strength at the zone of overlap and Van Vliet et al suggest embodiments directed to both a single strip overlapped onto to itself and a grid-like mat comprising crossing strips, wherein the same bonding technique is carried out in both embodiments, one of ordinary skill in the art would have readily appreciated the teaching of Kobiella being directed to the zone of overlap of a

single strap overlapped onto itself would have further been pertinent to the zone of overlap formed by crossing strips in a grid as disclosed by Van Vliet et al.

Additionally, Kobiella provides positive motivation to employ spatially separated bonding lines in the zone of overlap of a wrapped strip, and while appellant's have argued such motivation does not address the problem of early rupture encountered in the zone of overlap of a grid, appellant's have supported this assertion with nothing more than appellant's arguments and therefore the spatially separated bonding suggested to overcome the problem of early rupture has not been recognized as an unexpected result.

Furthermore, Kobiella provides motivation to bond the zone of overlaps in the strip embodiments of Van Vliet et al (a single strap wrapped onto itself or two strips crossed to form a grid) with spatially separated bonding lines so as to improve the tensile strength of the strip(s) at the zone of overlap. The fact that appellant has asserted employing spatially separated bonding lines or bonding points in the zone of overlap for what appears to be a different advantage (to counter early rupture), does not alter the conclusion that the use of spatially separated bonding lines in the prior art's zone of overlap would be prima facie obvious.

Appellant's arguments that Kobiella suggests the spatially separated bonding lines maintain at least 75% of the strap strength, wherein the prior art grids, such as taught by Van Vliet et al, already maintain 85% of the strap strength in having been fused over their entire zone of overlap, rendering no motivation to include spatially separated bonding lines as there would be no increased strength, is not found

persuasive. It is first noted, Kobiella discloses at least 75%, which would appear to suggest 75% and higher, with no upper limit provided. One of ordinary skill in the art at the time of the invention would have readily expected from Kobiella's general teaching as provided in Col. 2, lines 21 – 46, the strength across a zone of overlap would increase from its original strength by employing spatially separated bonding lines as such maintains orientation within the strips at the zone of overlap. The exact extent of the strip strength in the welding zone would have been influenced by a variety of factors, including number of bonding lines, the spacing of bonding lines, and the polymeric material of the strip, all of which one of ordinary skill in the art would have readily appreciated as contributing factors. That is, one of ordinary skill in the art at the time of the invention would have been motivated by Kobiella's general suggestion of increased strip strength by maintaining orientation of the strip(s) at regions in the zone of overlap and one of ordinary skill in the art would have readily expected in employing the technique of Kobiella to weld the strips of Van Vliet et al the orientation of the stips would be maintained and in turn the strength of the strips at the weld zone would increase.

In regard to appellant's argument with respect to Romanek, Romanek is merely supplied as evidence of additional patterns of bonding. Kobiella has already established motivation for providing spaced bonding in the zone of overlap to the teaching of Van Vliet et al and as such, Romanek is provided as evidence that additional bonding patterns, beyond parallel spaced lines (i.e. bonding points) are known in the pattern bonding art and would provide similar results.

In regard to appellant's argument that none of the references taken singularly, or in combination, teach a width of bonding points or lines being 5 mm or less as recited in claim 4 or 3 mm or less as recited in claim 5 (Appellant's Brief, page 18, lines 12 - 16), it is again noted that Kobiella positively teaches the separated bonding lines, or fused regions, to be 2.5 mm in width (Col. 4, lines 13 – 27).

In regard to appellant's argument (claims 15 and 16), that none of the references taken singularly, or in combination, teach that the grid has a strength about equal to the higher tensile strength in the lengthwise direction of the strips (Appellant's Brief, page 18, lines 17 - 25), it is noted as addressed in the rejection of record that Van Vliet et al as noted in Saito teaches forming a mat having high tensile strength in the longitudinal direction because each strip of the mat has been drawn to orient the molecules in the longitudinal direction. Furthermore, Van Vliet et al suggests that the mesh mats have almost the same strength as the sum of the strengths of the strips located in one direction (page 4, lines 12 – 15.) Kobiella as discussed above, provides motivation for the spatially separated bonding as required, wherein said spatially separated bonding lines act to maintain the strength of the strip at the zone of overlap, which act to maintain the strength of the entire grid.

Appellant's argument (claim 6) that while Foglia and Hoechst teach the use of laser to weld thermoplastic strips, they do not appreciate or teach the use of laser to form spatially separated bonding lines is not found persuasive. The limitation to form spatially separated bonding lines is found in the secondary reference to Kobiella. Foglia and Hoechst are merely employed to suggest laser is a known means used to weld

thermoplastic strips, wherein laser is a known source of electromagnetic radiation, the source suggested by the primary reference to Van Vliet et al.

In regard to appellant's argument that claims 9 – 13 should be rejoined, such is not an appealable issue.

Conclusion

It is admitted that Van Vliet et al teaches fusing over the entire zone of overlap, failing to disclose at least two spatially separated bonding lines or bonding points. However, Van Vliet et al are concerned with strip strength at the welding zones and likewise, the secondary reference to Kobiella is concerned with strip strength at overlapped welding zones. Kobiella teaches spatially separated bonding lines, wherein said spatially separated bonding lines are an improvement over fusing over the entire region as the separated bonding lines increase the strength of the strip(s) at the zone of overlap by retaining a sufficient amount of tensile strength with the strip(s). In view of the primary reference disclosing embodiments directed to both a single strip fused onto itself and a grid formed by fusing cross strips at a zone of overlap, and disclosing to employ the same bonding technique in both embodiments, one of ordinary skill in the art would have been motivated to combine the teaching of Kobiella to the grid embodiment of Van Vliet et al and form spatially separated bonding lines within the zone of overlap as means to retain tensile strength within the strips and therefore maintain the strength of the grid at the zones of overlap. While neither Van Vliet et al, Kobiella nor any of the additional references of record recognize the problem of early rupture as argued by appellant, no further evidence beyond appellant's own arguments has been presented

to suggest this is would be an unexpected result. As such, the fact appellant has asserted employing spatially separated bonding lines or bonding points for this unrecognized advantage does not alter the conclusion that the use of spatially separated bonding lines as provided by Kobiella in the teaching of Van Vliet et al would be prima facie obvious.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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TJK
November 28, 2003

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